

COURSE OUTLINE OF RECORD

Dept., Number	CSC 3322	Course Title	Computer Architecture
Semester Hours	3		
Year	2006	URL (if any):	

Current Catalog Description:

This course focuses on design alternatives in computer architecture. It covers instruction set architectures, memory subsystem organization, interfacing concepts, and interprocessor communication. Architectures to be studied will include data flow machines, vector and array processors, and pipeline architectures. Concepts related to parallel and distributed algorithms will also be studied. Prerequisite: CSC 3321.

Textbook:

Computer Organization and Design: The Hardware/Software Interface, by David A. Patterson and John L. Hennessy, 3rd edition, Morgan Kaufmann Publishers, 2005, ISBN 1-55860-604-1

Online resources provided with the textbook at <http://www.mkp.com/>

Course Goals:

To revise and enhance basic hardware and assembly language concepts, and to introduce principles of:

1. control and pipelining
2. memory hierarchies, caching, and virtual memory
3. I/O subsystem organization and control
4. multiprocessors

Prerequisites by Topic:

Some programming experience with assembly language programming for RISC computers (such as MIPS R2000/R3000) or CISC computers (such as VAX).

Major Topics Covered in the Course (number of weeks):

Computer abstractions and technology	1 week
The role of performance	1 week
Instructions: language of the machine	2 weeks
The processor: datapath and control	2 weeks
Enhancing performance with pipelining	2 weeks
Large and fast: exploiting memory hierarchy	2 weeks
Interfacing processors and peripherals	2 weeks
Multiprocessors	2 weeks
Total lectures 14 weeks, revisions and mid-semester exam:	

Estimate Curriculum Category Content (Semester hours)

Area	Core	Advanced	Area	Core	Advanced
Algorithms			Data Structures		
Software Design			Prog. Languages		
Comp. Arch.	3				

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Oral and Written Communication:

Every student is required to submit at least 1 written report (not including exams, tests, quizzes, or commented programs) of typically 8 pages and to make 1 oral presentation of typically 10-15 minutes in duration.

Social and Ethical Issues:

Students are required to read at least two different articles for class review and discussion. Open class discussion is lead by instructor and all students are required to give input.

Theoretical Content:

Analog and digital signaling concepts, data Encoding techniques, circuit multiplexing methods, circuit and packet switching concepts, network systems and data routing, protocols and architectures.

Problem Analysis:

Students are asked to analyze the differences between asynchronous and synchronous communication models, circuit and packet switching systems, data encoding methods, error detection and correction methods, protocols, transmission media, and basic computer network technology.

Open-Ended Design:

None is required for this course.